Also
$$d\lambda_i = \frac{h_i\,dt}{r_i^2} = h_i \frac{\rho^2}{r_i^2}\,d\psi$$
$$= \frac{h_i\,\mathrm{a}_i\,d\psi}{(\psi + a_i)^2 + h_i^2},$$
$$\tan(\lambda_i + \beta_i) = \frac{\mathrm{a}_i}{h_i}(\psi + a_i).$$

In the second place, let A^2 be negative. Here it is only necessary in some places to accomplish the integrations by the aid of hyperbolic cosines instead of circular.

The differential equations of this problem, in the case where the *radii* are supposed to describe no areas, were first integrated by Binet.* But the addition, to the forces, of the terms arising from centrifugal action, much enhances the interest of the problem.

*See Liouville, *Journal de Mathématiques*, First Ser. Tome II. p. 457.

ON THE FOCAL CHORD OF A PARABOLA.

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Let $y^2 = 4ax$ be the equation to a parabola, s its focus, and PSP' a focal chord. Let the tangent and normal at P' meet the diameter through P at M and N.

It may be easily proved that $PM = PN = PP'$ and that a similar property holds for the tangent and normal at P.

Therefore, if two equal rhombs be constructed on PP' having two other sides of each parallel to the axis, their diagonals are tangents and normals at P and P'; and the tangent at one point is parallel to the normal at the other.

Each normal chord divides the other in the ratio 1 : 3.

The chord joining the other ends of the normal chords is parallel to PP' and three times as long.

A line perpendicular to PP' at S, and terminated by this parallel chord and the pole of PP', is divided by S in the ratio 1 : 4.

Hence the locus of the foot of the perpendicular dropped from S on the parallel chord is a right line, whose equation is $x = 9a$.

Hence the envelope of the parallel chord is a confocal parabola, having for its equation $y^2 = 32a(9a - x)$.

It cuts the original parabola orthogonally where it is cut by its evolute.